

REMARKS

The specification has been amended in two places to place the text into more idiomatic English.

In the Office Action dated September 28, 2009, claims 1 to 5 and 10 to 12 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Specifically, with respect to claim 1, line 7, the Office Action stated that it was unclear how at least one row of a plurality of nozzles can comprise one nozzle for spraying treating agent. Claim 1 has been appropriately amended.

Claims 1 and 3 were rejected under 35 U.S.C. § 102(b) as being anticipated by PCT Patent document WO 02/072953 (Nissinen). In Nissinen, nozzles 36 blow “moist air or steam into the entry gap of the web in order to moisten the air entering the application chamber and to improve condensation on the cooled surfaces of the chamber.” (Nissinen, page 14, lines 2 to 5). However, as stated in applicants’ Specification, these two options, moist air or steam, have drawbacks which the invention recited in claim 1 overcomes. With respect to using moist air, the Specification states:

“In solutions, wherein moist air is blown into the application chamber, the coating unit must be provided with an air humidifier, which increases the price of the equipment. Drops of coating mixture are also formed in the air nozzle, which drops may drip onto the surface of the web. Furthermore, the air blowing increases the pressure in the application chamber, whereby some mist of the coating mix may leak into the machine room.” (Specification, page 2, line 29 to page 3, line 2).

With respect to using moist air, the Specification states:

“If steam is blown into the application chamber, the equipment must be provided with a steam generator, which increases the equipment and operation expenses of the coating unit. In addition, the steam increases the thermal stress of the application chamber, which in turn increases the surface temperatures of the application chamber and thus decreases the condensation of the mist of coating mixture on the surfaces.” (Specification, page 3, lines 3 to 7).

In contrast, in accordance with the invention recited in claim 1, water mist is sprayed into the application chamber, which, as stated in the Specification, has benefits:

The water mist does not increase the temperature of the application chamber surfaces, which is the case when blowing steam into the application chamber. The operation and equipment expenses of water spraying are lower compared with blowing moist air or steam. Furthermore, the fine water mist effectively moistens the air in the application chamber, whereby it is easier for the moisture to condense on the surfaces. In addition, an extremely thin aqueous layer is formed on the web before the coating mix mist is sprayed, increasing the surface energy of the surface, which in turn contributes to the formation of a uniform

liquid film on the surface of the web when applying the coating mix.”
(Specification, page 3, line 23 to page 4, line 2).

In addition, the use of any kind of liquid water in connection with coating of paper or paperboard is typically avoided since water droplets are well known to cause imperfections to the coating applied to the paper. Therefore, actually spraying water into a coating application chamber is contrary to the teaching of the prior art, which teaches that liquid water should not be sprayed onto a paper web being coated or into a coating application chamber. For these reasons, independent claim 1 is patentable over Nissinen. Dependent claims 2 to 5 and 10 to 12 are patentable over Nissinen for the reasons that claim 1 is patentable.

Additionally, with respect to dependent claims 2, 10, 11 and 12 which recite specific drop sizes for the water sprayed, it has been discovered that when a water mist having a small water droplet size is sprayed into the coating application chamber, the droplets surprisingly do not conglomerate into large droplets which would adversely affect the quality of the coating applied to the paper web. Although the coating application chamber is filled with small particles that could act as nuclei for growth of droplets, such growth does not take place if very small droplets are sprayed into the coating application chamber.

Claims 2, 4, 5 and 10 to 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nissinen in view of U.S. Patent No. 3,388,965 (Garrett). Garrett (col. 2, lines 45-57 and col. 3, lines 4-9) does not disclose spraying water droplets, and therefore does not add what is missing from Nissinen with respect to applicants’ independent claim 1, or applicants’ dependent claims 2, 4, 5 and 10 to 12.

For these additional reasons, claims 1 to 5 and 10 to 12 are patentable

Allowance of this application is respectfully requested.

Respectfully submitted,
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Dated: January 20, 2010